DOCUMENT RESUME

ED 095 365 95 CE 001 929

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TITLE Costs of Developing Interest Inventories and Implications for Change.
INSTITUTION Aries Corp., Minneapolis, Minn.
SPONS AGENCY National Inst. of Education (DHEW), Washington, D.C.
PUB DATE 1 Feb 74
CONTRACT OEC-0-72-5240
NOTE 34p.; For related documents see CE 001 926-928 and CE 001 930-935, Draft

EDRS PRICE MF-$0.75 HC-$1.85 PLUS POSTAGE
DESCRIPTORS *Costs; Federal Aid; *Financial Needs; Financial Support; Interest Research; *Interest Scales; *Interest Tests; Private Financial Support; Racial Discrimination; Sex Differences; *Sex Discrimination; Sex Stereotypes; Test Bias; Vocational Interests

ABSTRACT

The paper surveys the costs of interest-inventory revision and concludes that, ultimately, the elimination of sex bias in career interest inventories will depend on project funding. After the issues of criterion sample, item pool, instructional orientation, interpretation, and legality have been settled, researchers and publishers will have the guidelines necessary for removing, or at least minimizing, sex bias in the use and interpretation of interest inventories. Then attention must focus on the issue of finances. Funding must include a yearly $75,000 to $80,000 allowance for personnel. Construction of one empirical occupational scale costs $1,900 to $2,000, complete revision of an interest inventory costs a minimum of $270,000, with publishing expense bringing the total to $385,000. Three years is the absolute minimum estimate for a complete revision. Financial support for researchers must increase. Possible funding sources include publishers, universities, and scoring services; Federal government; professional organizations; and special interest groups. (Author/AJ)

DRAFT

Costs of Developing Interest Inventories and Implications for Change

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February 1, 1974

This paper was funded under a contract to the ARIES Corporation (#OE-C-72-5240) from the National Institute of Education of the U.S. Department of Health, Education, and Welfare. The views expressed do not necessarily reflect those of the ARIES Corporation, the National Institute of Education, or any agency of the U.S. Government.

Costs of Developing Interest Inventories and Implications for Change

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In the Preface of Vocational Interests of Men and Women (1943), E. K. Strong, Jr. acknowledged two major financial contributions that subsidized his investigation of vocational interests and the development of the Strong Vocational Interest Blank (SVIB): $18,000 received from the Carnegie Corporation in 1935 and $27,400 in grants from the Council of Research in the Social Sciences spread over a period of years.

Thirty years later, the development of a new interest inventory has a projected budget of $340,000 and an anticipated time schedule of three years; interest inventory revisions, which once dragged on for as long as thirteen years, now are completed in three compact, intense years.

Authors and publishers, previously motivated internally to update and better their tests, are urged to revise by psychologists, educators, lawyers and students, who express interest in the psychometric quality, the legality, and the usefulness of interest inventories for career education, for vocational decision-making, and for generating occupational opportunities.

No longer may the vocational interest researcher casually decide, "I think the time has come for a revision; twenty years have passed since the last one." Users of inventories recognize the potential influence of vocational interest measurement and demand instruments that are progressive and future-oriented, instruments that will widen occupational horizons and open the world of work, rather than constrict individual development and choice.

Before attempting interest inventory construction and revision, five basic issues must be explored:

1) the criterion sample issue

Is the instrument fair to men and women? Are social class, race, and sex moderator variables? Should different inventories be used with different age groups? What are the appropriate criterion and reference groups? Do they become out-dated? What does research show about the rate of change?

2) the item pool issue

Should both sexes respond to the same items? Should activities that have traditionally been assigned to one sex be included? Can effective items, that are free of socialization effects, be found?

3) the instructions and directions issue

How should the instructions address the subject? Do instructions limit responses?

4) the interpretive issue

What are the implications of administering the men's form to women and vice versa? Are sex-role stereotypes of men and women presented in interpretive materials? Do the profiles list different occupations for men and women? Are manuals and student interpretive materials clear that occupations may be for persons of either sex? Should scores be reported for males on female-normed scales for which there are no male counterparts and vice versa?

5) the legal issue

Does the use of popular standardized interest measures in employment and education constitute a violation of the civil rights of female examinees? What are the implications of Title IX of the Education Amendment, 1972, for the continued use of available standardized interest measurement instruments? What legal questions are raised by the use of separate test norms for males and females?

Solutions to these issues and questions may be derived from an assortment of sources. Empirical data answer many of the technical problems and questions; lawyers provide legal guidelines; inventory users submit suggestions and criticisms; advisory committees input decision-making policies; professional commissions contribute expertise and objective guidelines.

Still, many of the issues have several possible solutions; some answers are provisional hypotheses waiting for future proof or disproof, and other problems have no immediate solution.

A sixth basic issue for publishers and researchers is finances. Who should support the research centers? Who provides the funds to guarantee thoughtful and careful inventory development? The counselor? The client? The courts? The professional organizations? The advisory committee?

Typically, the publisher assumes financial obligation for revisions and new editions. Scoring services finance development of computerized interpretations; universities may provide physical space; the federal government funds career education and guidance projects; a small grant dribbles in here and there. But the primary financial burden for test development remains the publisher's responsibility.

Caught between researchers requesting money and time to insure sound decisions and quality work, and the public expecting the immediate release of better instruments, the publisher does not occupy an enviable position. Test users become impatient with the slow ponderous movement of test construction, while researchers envision themselves tearing along at breakneck speeds, underfunded and understaffed.

Globally, interest inventories are expensive to develop and revise; the projects are time consuming. But what, precisely, are the costs? What are the expenses of developing new interpretive methods, of integrating occupational interest information with cognitive data, the Occupational Outlook Handbook, and the Dictionary of Occupational Titles? What are the publishing costs for a new manual? How are "expensive" and "time-consuming" defined? By hundreds of dollars or thousands? By weeks or months or years?

Sex bias does occur in career education. The sources of bias must be identified; revisions must be made. Developmental cost is one variable that will affect change of interest inventories and interpretive methods.

Revising interest inventories[1]

The steps necessary to accomplish the revision of an instrument such as the Strong Vocational Interest Blank (SVIB) are: 1) select and revise the item pool, 2) determine a new general reference sample, 3) revise the existing homogeneous Basic Interest Scales, 4) revise the existing empirical Occupational Scales, 5) collect new criterion samples, 6) construct new and timely Occupational Scales, 7) provide normative and stability data, 8) improve the profile format, 9) update test interpretation information, and 10) write a new manual.

Eight basic requirements must be met before attempting such a project; they are:

1) an archival system with easily retrievable data

2) a research psychologist, well versed in the desirable characteristics of an interest inventory, sophisticated in empirical research and statistical analysis, and knowledgeable of the history of the inventory; an individual with the authority to determine priorities

3) computer programmers sophisticated in programming and knowledgeable of the data storage formats and data analysis programs

4) research assistants, capable of working with a minimum of supervision, who are familiar with the inventory being revised and vocational interests in general

5) a secretary, skilled in manuscript preparation

6) clerks, preferably with typing and key punching skills

7) access to computer facilities and optical scanner

8) sufficient computer time to facilitate a steady production of data

Thus, the personnel for an ideally staffed research center would be one professional, two computer programmer-research assistants, one research fellow, one secretary, and four clerk-typists. The total cost per year to staff such a center would be $77,000.

Machine costs for one year average $10,000, including leases for an optical scanner, calculator, key punch, typewriters, and substantial computer time. Materials -- paper, computer tapes and cards, printing, postage -- total $3,000 per year. (Refer to Table 1 for itemized estimates of costs for the complete revision of an interest inventory.)

INSERT TABLE 1 ABOUT HERE

If the personnel involved are motivated and responsible to the project, one can reasonably expect to complete the revision of an instrument such as the Strong Vocational Interest Blank in three years for a total of $270,000.

Constructing new empirical occupational scales[2]

A pertinent task for test constructors at this time is the addition of new scales, which more completely represent the occupational world, to current inventories. Vocational psychologists must now study both men and women within an occupation; they must search out men in nursing and women in optometry; they must expand their inventories to include occupations which in the past have been virtually closed to one sex or the other.

The addition of even one scale to an interest inventory creates the need for several other changes -- readjusting the profile, providing additional interpretive information in the manual, supplying reliability and validity data. The major tasks involved are:

1) locating an occupational source for selecting subjects; for example, finding female funeral directors or male dental hygienists
2) collecting the criterion sample
3) analyzing the item statistics
4) constructing the scale
5) computing reliability and validity data

Assuming that one need not subsidize personnel or machine costs, the expenses for developing one scale are $1,935. (Refer to Table 2 for itemized material and computer costs.)

INSERT TABLE 2 ABOUT HERE

The minimum time required to develop a new empirical occupational scale is four months. This estimate anticipates an allotment of three weeks for criterion sample collection tasks; 8 weeks for subject response, and five weeks for data analysis and scale construction. (Refer to Table 3)

INSERT TABLE 3 ABOUT HERE

Routine tasks, such as compiling a mailing list or editing answer sheets,[3] consume an incredible number of hours. For example, one person working diligently will take eight days to compile a mailing list, another seven days to mail out the sample, and six days to edit the returned answer sheets.

Publishing[4]

Capital outlay over the years by the publisher of an interest inventory, exclusive of research and development costs, represents an investment of $100,000 to $115,000.

The publisher provides editing, design, and management time; supplies testing materials; and absorbs thousands of dollars of printing, promotion, and publishing costs. Table 4 provides detailed expenses to the publisher over a five year period, a realistic time frame for developing an inventory properly.

INSERT TABLE 4 ABOUT HERE

Developing new interest inventories[5]

One interest inventory cannot be all inclusive, providing a profile reflecting every occupational area and level. Possibly one interest inventory cannot be used with all age levels. Perhaps test constructors should be preparing inventories designed for specialized groups.

The decision to develop a new interest inventory versus retain and revise an existing inventory must consider the utility of the old versus the new. In terms of financial gains, revisions rarely pay off for the amount spent. However, new inventories, although more profitable, fail to provide an extensive body of published information on the inventory or longitudinal studies which establish validity for interpretive data.

To construct a new interest inventory that would feature 30 empirical scales, one would need a budget of $340,000 allocated for a three-year research period. Personnel alone would use $232,500 of the budget. This estimate assumes that the project director is knowledgeable in the field. If the director is not familiar in detail with the specifics of interest inventory development, personnel costs could be doubled and project time increased to five or six years. (Refer to Table 5 for personnel, machine, and material costs for developing a new interest inventory.)

INSERT TABLE 5 ABOUT HERE

The $340,000 estimated research budget for developing a new interest inventory includes: 1) collecting the item pool, 2) generating item validity and reliability data, 3) designing a test booklet, answer sheet, and interpretive profile, 4) collecting criterion samples, 5) constructing 30

empirical occupational scales, 6) providing validity, reliability, and normative data, 7) preparing test interpretation information, and 8) writing a new manual.

The time expended for research and development of a new interest inventory, or for the revision of an existing inventory, is three years minimum. The publisher of the instrument is involved with the project for at least a one year organizational period prior to the commencement of the research, and for an additional year of editing, printing, and promotion after the last scale has been constructed. Table 6 provides an integrated overview of the time schedules for the three processes: revising an interest inventory, developing an interest inventory, and publishing an interest inventory.

INSERT TABLE 6 ABOUT HERE

Developing computerized interpretation of interest inventories[6]

The number of scales in interest inventories has burgeoned during the last 45 years. The 1928 Manual for the Strong Vocational Interest Blank listed 12 available occupations, 11 that were under development, and six that were expected soon. (Campbell, 1968) The 1966, Form T399 and 1968, Form TW398 revisions of the SVIB each had over 80 scales to be scored. The latest SVIB revision, Form T325, the Strong-Campbell Interest Inventory, will have a profile with 155 scales.

Counselors and clients are faced with a plethora of data -- General Theme scales based on Holland's theory of vocational types (Campbell and Holland, 1972; Hansen and Johansson, 1972), homogeneously constructed Basic Interest scales (Campbell, et. al., 1968), empirical Occupational scales, and empirical Non-occupational scales (Campbell, 1971).

Computerized interpretive profiles assist users of interest inventories in comprehending the increased information, and help to minimize information overload.

To develop a computerized interpretive analysis of an interest inventory such as the Strong Vocational Interest Blank would require three months and approximately $17,000. The project director, a Ph.D. psychologist, must be knowledgeable of the interest inventory's construction and development as well as interpretive data and methods. Supporting staff would include clerical and computer programmer personnel. Table 7 details the developmental costs for a computerized interpretive analysis of an interest inventory.

INSERT TABLE 7 ABOUT HERE

Implementing a computerized vocational guidance system[7]

The step beyond computerized interpretive analysis of interest inventories is the complete integration of vocational and educational information into a computerized guidance system. Vocational interest data are used most effectively in conjunction with cognitive data, such

as the Differential Aptitude Test Battery (DAT), the General Aptitude Test Battery (GATB) and Nonverbal Aptitude Test Battery (NATB); the Dictionary of Occupational Titles; the Occupational Outlook Handbook; and an index of job satisfaction.

The Milwaukee Computerized Educational Guidance System (EDGUYD) (Cassel and Mehail, 1973) and the Milwaukee Computerized Vocational Guidance System (VOCGUYD) (Cassel and Mehail, 1973) are computer-based search and screening modes of operation, designed to assist in the narrowing of occupational and educational choices by relating the individual's interests with the specific requirements for a particular school or job.

EDGUYD provides orientation and planning experiences for individuals making post-high school education plans. The system presents, for the subject's personal consideration, all available four-year or highly specialized post-high school opportunities within the United States and post-high school opportunities of any type within Wisconsin.

VOCGUYD facilitates the development of vocational maturity among secondary students, helping them to narrow personal career choices from among 1,112 basic career areas to four or five that may be studied more intensively and providing them orientation in all areas pertinent to career planning and the world of work.

To implement computerized guidance systems such as VOCGUYD and EDGUYD, several basic requirements need to be met:

1) one vocational guidance counselor sophisticated in the use of instruments such as the Kuder Occupational Interest Inventory (OIS), the SVIB, the Ohio Vocational Interest Survey (OVIS), and resource material such as the Dictionary of Occupational Titles

2) one educational guidance counselor sophisticated in the use of instruments such as the DAT and the GATB

3) a project director, who may be either (1) or (2) in conjunction with other duties, capable of determining priorities with personal involvement in the task

4) two clerks with key punching skills

5) computer programmers sophisticated in routine and micro programming, with the skills to adapt programs economically to the respective computers involved

6) sufficient computer facilities, computer time, and materials

Two additional requirements are essential for using the VOCGUYD and EDGUYD systems:

1) auxiliary programs designed to enlighten participants about testing instruments such as the Kuder, OVIS, DAT, SVIB

2) programs to instruct counselors in new developments in vocational and educational psychology such as Bloom's mastery learning, Havighurst's critical development stages, and Loevinger's ego development

The computerized guidance project expenses would include two professionals, two key punch and clerical personnel, computer time, and computer equipment and facilities -- an expense of $57,000. (Refer to Table 8 for a detailed estimate of costs.)

INSERT TABLE 8 ABOUT HERE

The cost for the use of such a program, if the requesting agency has a UNIVAC 1108, a DIGITAL PDP-11, or a Honeywell 6000 computer, is from $100 to $200, or the amount necessary to place the programs on a tape and transport them to the new agency.

Discussion

Ultimately, the elimination of sex bias in career interest inventories will depend on project funding. After the issues of criterion sample, item pool, instructional orientation, interpretation, and legality have been settled, researchers and publishers will have the guidelines necessary for removing, or at least minimizing, sex bias in the use and interpretation of interest inventories. Then attention must focus on the issue of finances.

Interest inventory revisions are costly; development of new instruments are equally expensive. For either project, funding must include a yearly $75,000 to $80,000 allowance for personnel. Construction of one empirical occupational scale costs $1,900 to $2,000; complete revision of an interest inventory such as the Strong Vocational Interest Blank, which represents 45 years of data collection and empirical research, costs a minimum of $270,000; the publishing expenses above developmental costs are $115,000, bringing the expended funds to $385,000.

Revisions also are time-consuming. Three years is the absolute minimum estimate for a complete revision. Construction of a new inventory, providing only 20 percent of the scores presented on an instrument such as the Strong-Campbell Interest Inventory, exhausts three years. The development of one empirical scale requires at least four months.

To increase the activity of interest inventory research, financial support for researchers must increase. Possible funding sources include:

1) continued support by publishers, universities and scoring services
2) increased monies through federal funding
3) aid from professional organizations
4) funding from special interest groups

Unfortunately, without outside financial aid and assistance, much interest inventory research may be forced to halt, and needed revisions of interest inventories may be impossible to accomplish.

Footnotes

[1] Cost estimates obtained from the Center for Interest Measurement Research, University of Minnesota, Minneapolis, Minnesota.

[2] Cost and time estimates obtained from the Center for Interest Measurement Research, University of Minnesota, Minneapolis, Minnesota.

[3] To facilitate accurate optical scanning of item responses, each answer sheet must be examined to ensure that all items are answered, that the marks are dark, and that the name grid is properly completed.

[4] Cost estimates based on information obtained from Mr. Leon Seltzer, Director Stanford University Press, Stanford, California.

[5] Cost estimates based on information obtained from Dr. Charles B. Johansson, Director of Test Development, National Computer Systems, Minneapolis, Minnesota.

[6] Cost estimates based on information obtained from Dr. Charles B. Johansson, Director of Test Development, National Computer Systems, Minneapolis, Minnesota.

[7] Cost estimates based on information obtained from Dr. Russell N. Cassell, Professor of Educational Psychology, University of Wisconsin - Milwaukee, Milwaukee, Wisconsin.

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Table 1

Costs for the Complete Revision of an Interest Inventory

Personnel	Number	Appointment	Cost Per Year	Function
Ph.D. Psychologist	1	full time	$ 30,000.00	Project Director/Knowledgeable in areas of vocational interest measurement, testing, statistics, and homogeneous and empirical scale construction/Coordinate publisher and research center activities/Inform profession and public about research activities/Train research staff/Train other professionals/ Generate research projects
Research Fellow	1	full time	15,000.00	Coordinate scale construction activities
Computer Programmer	2	half time	15,000.00	Computer Programming/Data analysis
Secretary	1	full time	8,000.00	Typing/General office assistance
Clerical	2	half time	8,000.00	Key punching/Editing/Mailing/Collect criterion samples
Miscellaneous Staff			1,000.00	Type labels/Mail back profiles/Editing
TOTAL PERSONNEL COSTS				
$ 77,000.00 per year				
Machines				
Optical Scanner	1		600.00	
Key Punch	1		600.00	

Table 1 (Cont'd)

Costs for the Complete Revision of an Interest Inventory

Machines (Cont'd)	Number	Cost Per Year
Typewriter	4	$ 1,200.00
Calculator	1	300.00
Computer time		7,000.00
Miscellaneous		300.00

TOTAL MACHINE COSTS

$ 10,000.00 per year

Materials

Pencils/Paper/Printing/ Computer Tapes/Postage/ Labels/Envelopes	3,000.00

TOTAL PROJECT BUDGET

$270,000.00 ($90,000.00 per year)

TOTAL PROJECT TIME

3 years

Table 2[a]

Developmental Costs for the Construction of

New Empirical Scales for an Existing Interest Inventory

Materials	Number	Cost	Postage as of 3/2/74 (Number mailed)	
2 Cover Letters	1600	$ 16.00		
1 Questionnaire	800	8.00		
4 Mailing Labels	3200	71.00		
1 Follow-Up Postcard	800	68.00	$ 80.00 (800)	
1 Second Follow-Up	600	16.00	60.00 (600)	
2 Large Envelopes (9x12) (1 Initial Mailing) (1 Profile Return)	1200 (800) (400)	12.00	216.00 (1200)	
1 Profile Interpretation Letter	400	8.00		
1 Return Envelope (#10)	800	8.00	48.00 (400)	
1 Test Booklet	800	32.00		
1 Answer Sheet	800	16.00		
Miscellaneous		200.00	100.00	
TOTAL		$ 431.00	+ $ 504.00	= $ 935.00

Table 2 (Cont'd)

Developmental Costs for the Construction of

New Empirical Scales for an Existing Interest Inventory

Computer	Number	Cost
Profile Scoring	400	$ 400.00
Computer Tapes	4	50.00
Item Analysis		100.00
Scale Construction		100.00
Validity and Reliability Data Analysis		100.00
Miscellaneous		250.00
TOTAL		$1,000.00

TOTAL COST PER SCALE[b]

$ 1,935.00

[a] Data based on initial mailing sample with N = 800, rate of return estimated at N = 400.

[b] This estimate does not include personnel or machine costs; these data may be found in Table 1.

Table 3[a]

Developmental Time for the Construction of

New Empirical Scales for an Existing Interest Inventory

Task	Time
Mailing List	3 days
Compile list	
Type mailing labels	
Mail Sample	7 days
Prepare master list	
Number answer sheets and questionnaires	
Color code return envelopes	
Stuff and seal envelopes	
Run envelope through postage meter	

Time allotment: Criterion Sample Collection Tasks = 3 weeks

Table 3 (Cont'd)

Developmental Time for the Construction of

New Empirical Scales for an Existing Interest Inventory

Task	Time
First Follow-up:	1 day
Label post cards	
Run cards through postage meter	
Second Follow-up:	2 days
Identify non-responders	
"Label" follow-up	
Run follow-up through postage meter	
Returns	4 days
Open envelopes	
Select usable and unusable subjects	
Record receipt	
Order answer sheets by number	
Editing:	6 days
Assign subject number	
Copy torn answer sheets	
Re-mark light responses	
Fill in name grid properly	

Time allotment: Subject Response and Post-mailing Tasks = 8 weeks

Table 3 (Cont'd)

Developmental Time for the Construction of

New Empirical Scales for an Existing Interest Inventory

Task	Time
Summary data:	1 day
Calculate mean age, experience, and education	
Write criterion sample description	
Score profiles:	10 days
Profile Return:	2 days
Separate profiles	
Stuff and seal envelopes	
Run envelopes through postage meter	
Address envelopes	

Time allotment: Data Analysis and Scale Construction = 5 weeks

Table 3 (Cont'd)

Developmental Time for the Construction of

New Empirical Scales for an Existing Interest Inventory

Task	Time
Item Analysis:	3 days
Calculate item response percentages for criterion sample.	
Compare in-general sample to criterion sample	
Select cut-off percentage and number of items	
Scale Construction:	7 days
Reliability and Validity Data:	5 days
Score in-general samples on new scale	
Mean profile of criterion sample	
Calculate test-retest correlation	
Calculate Tilton's percent overlap	
Compute correlations with existing scales	

TOTAL PROJECT TIME: 4 months

[a] Time estimates based on initial mailing sample with N=800, rate of return estimates at N=400

Table 4

Publishing Costs for an Interest Inventory, Exclusive of Research and Development Expenses

	Cost	Time
Personnel		
Editing, design and management time	$10,000 per year	5 years
Materials		
Experimental editions Research answer sheets	$ 1,000.00 to $2,000.00 per year	5 years
Printing	$10,000.00 to $20,000.00 at time of publication	
Promotion	$10,000.00 at time of publication	1 year
Publishing Costs	$25,000.00 at time of publication	1 year
Warehousing		
Selling		
Accounting		
General Overhead		

Table 4 (Cont'd)

Publishing Costs for an Interest Inventory, Exclusive of Research and Development Expenses

Total Project Budget

$100,000.00 to
$115,000.00

Total Project Time

5 years

Table 5

Developmental Costs for a New Interest Inventory,

Exclusive of Publishing Expenses

Personnel	Number	Cost Per Year	Function
Ph.D. Psychologist	1	$ 30,000.00	Oversee and coordinate staff/Develop item pool/ Prepare test booklet/Design profile/Organize item analysis/Write Manual/Oversee scale construction, reliability and validity studies, and criterion sample collection.
Research Assistant	1	15,000.00	Collect criterion samples/Construct scales/ Study reliability and validity
Clerical	2	17,500.00	Typing/Mailing/Editing/General office assistance/ Key punching
Computer Programmer	1	15,000.00	Write computer programs
TOTAL PERSONNEL COSTS			
$ 77,500.00 per year			
Machines			
Computer		2,500.00	Program testing/Data analysis
Calculator/Xerox machine/Typewriter		5,000.00	Data analysis/Manual preparation/Test booklet preparation
TOTAL MACHINE COSTS			
$ 7,500.00 per year			

Table 5 (Cont'd)

Developmental Costs for a New Interest Inventory.

Exclusive of Publishing Expenses

	Cost Per Year
Materials	
Paper/Pencils/Printing	$ 3,334.00
Additional Costs	
For each scale developed	2,000.00
TOTAL PROJECT BUDGET	
$ 340,000.00 for 30 scales	
($ 113,334.00 per year)	
TOTAL PROJECT TIME	
3 years	

Table 6

Integrated Time Schedules for Revising an Interest Inventory, Developing an Interest Inventory, and Publishing an Interest Inventory

	Revising an Interest Inventory	Developing an Interest Inventory	Publishing an Interest Inventory
Year 1	Consult with publisher	Consult with publisher	Assess need for revised or new inventory Contact knowledgeable researcher Design experimental edition
Year 2	Select research staff Design project Refine item pool Revise test booklet and answer sheet Consult with publisher	Select research staff Design project Collect item pool Generate item reliability and validity data Design test booklet and answer sheet Consult with publisher	Management time Finance research project Consult with researcher
Year 3	Revise existing scales Generate reliability and validity data Begin to write manual Consult with publisher	Collect criterion samples Test subjects Construct occupational scales Consult with publisher	Management time Finance research project Consult with researcher

Table 6 (Cont'd)

Integrated Time Schedules for Revising an Interest Inventory, Developing an Interest Inventory, and Publishing an Interest Inventory

	Revising an Interest Inventory	Developing an Interest Inventory	Publishing an Interest Inventory
Year 4	Collect new criterion samples	Complete tasks of technical development	Management time
	Test subjects	Generate reliability and validity data	Finance research project
	Construct new occupational scales	Finalize profile and test booklet	Begin informing the public
	Generate reliability and validity data	Prepare manual and interpretive information	Consult with researcher
	Finalize profile, test booklet, manual, and interpretive information	Begin informing the public	
	Begin informing the public	Consult with publisher	
	Consult with publisher		
Year 5	Consult with publisher	Consult with publisher	Management time
	Inform the public	Inform the public	Editing
			Printing
			Promotion
			Selling
			Warehousing
			Informing the public
			Consult with researcher

Table 7

Developmental Costs for a Computerized Interpretive Analysis of an Interest Inventory

Personnel	Number	Appointment	Cost	Function
Ph.D. Psychologist	1	1/3 time	$ 10,000.00	Develop program specification Write explanatory manual Coordinate staff
Clerical	1	1/2 time	4,000.00	Typing General office assistance Key punching
Computer Programmer	1	50 hours	2,500.00	Write computer programs
Machines				
Computer			500.00	Program testing

Total Project Budget

$ 17,000.00

Total Project Time

3 months

Table 8

Development Costs for Implementing a Computerized Vocational Guidance System

Personnel	Number	Cost	Function
Vocational Guidance Counselor	1	$ 25,000.00	Sophisticated in area of vocational psychol and usual vehicles designed for such purpose i.e., DOT, Kuder, Super, Ohio, Strong/devel computer search and screening systems for career planning
Educational Guidance Counselor	1		Sophisticated in area of educational psychol and usual vehicles designed for such purpose i.e., DAT, GED, ITED/develop search and screening systems for post-high school education planning
Clerical	2	10,000.00	Typing/Key punching/General office assistanc
Machines			
Computer equipment and facilities		10,000.00	Program testing
Computer time		12,000.00	

Total Project Time

1 Year